

What is claimed:

1. A control panel apparatus having reconfigurable input buttons, said apparatus comprising:

5 a tactile sensor;

a plurality of input buttons reconfigurable by a user, a representation of said plurality of input buttons placed on said tactile sensor; and

electronics, coupled to said tactile sensor, for measuring a location of a touch to an input button and an existence of and a level of pressure of said touch and for
10 storing a plurality of functions, each of said plurality of functions associated with a corresponding one of said plurality of input buttons;

wherein said touch on one of said plurality of input buttons causes said electronics to measure said location and said level of pressure of said touch and said touch causes an occurrence of one of said plurality of functions associated with said
15 location and said level of said pressure of said touch.

2. The apparatus of claim 1, wherein the number of said plurality of input buttons can be reconfigured by the user.

20 3. The apparatus of claim 1, wherein the spatial relation between said plurality of input buttons can be reconfigured by the user.

4. The apparatus of claim 1, wherein the shapes of said plurality of input buttons can be reconfigured by the user.

25 5. The apparatus of claim 1, wherein the sizes of said plurality of input buttons can be reconfigured by the user.

30 6. The apparatus of claim 1, wherein the locations of said plurality of input buttons can be reconfigured.

7. The apparatus of claim 1, wherein the orientations of said plurality of input buttons can be reconfigured by the user.

8. The apparatus of claim 1, wherein the functions associated with each of said plurality of input buttons can be reconfigured by the user.

5 9. The apparatus of claim 1, further comprising:

a housing for enclosing said electronics and said tactile sensor, said housing including a slot for inserting said representation of said plurality of input buttons onto said tactile sensor.

10 10. The apparatus of claim 1, further comprising:

a housing for enclosing said electronics and said tactile sensor, said housing including a top, said top being removable to place said representation of said plurality of input buttons onto said tactile sensor.

15 11. The apparatus of claim 8, wherein the functions associated with each of said plurality of input buttons and with defined levels of pressure can be reconfigured by the user.

20 12. The apparatus of claim 11, wherein said functions include providing help, turning on, turning off, increasing, decreasing, and particular actions depending on said defined levels of pressure.

25 13. The apparatus of claim 11, wherein said functions include providing help, turning on, turning off, increasing, decreasing, particular actions depending on said defined levels of pressure, and providing particular actions depending on lengths of time that a defined level of pressure is exerted on said location.

30 14. The apparatus of claim 1 wherein said tactile sensor comprises a conductive foam elastomer.

15. A method of configuring an operating control device having a foam tactile sensor, said method comprising the steps of:

(a) defining an input button and a location of said input button corresponding to a portion of said tactile sensor;

(b) defining a first function of said input button, said first function associated with an existence of, a first defined level of pressure of, and a location of a touch on said tactile sensor; and

(c) defining a second function of said input button, said second function associated with an existence of, a second defined level of pressure of, and said location of a touch on said tactile sensor.

10 16. The method of claim 15, further comprising the steps of:

establishing a first configuration resulting from said steps (a) to (c);

generating a first representation of said input button for placement over the tactile sensor within said wherein operating control device; and

loading said first configuration into said operating control device to enable
15 said operating control device to determine an appropriate output dependent on said first or second defined level of pressure at said location of said touch.

17. The method of claim 16, further comprising the steps of:

changing said first function or said second function of said input button to
20 result in a different output;

establishing a second configuration resulting from said changing step;

loading said second configuration into said operating control device to enable said operating control device to determine a different appropriate output.

25 18. The method of claim 15, wherein said input button defining step includes defining the type of said input button.

19. The method of claim 15, wherein said type of said input button can comprise a toggle button, a pressure-sensitive button, a time-sensitive button, a one-dimensional control button, a two-dimensional control button, or a repeat button.

30 20. The method of claim 15, wherein said operating control device controls an external device coupled to said operating control device, and said operating control device and said external device are in a harsh environment or in an industrial setting.

21. A computer program product for configuring an operator control panel having a tactile sensor, said computer program product comprising:

computer code for defining an input button and a location of said input button corresponding to a portion of said tactile sensor;

5 computer code for defining a first function of said input button, said first function associated with an existence of, a first defined level of pressure of, and a location of a touch on said tactile sensor; and

computer code for defining a second function of said input button, said second function associated with an existence of, a second defined level of pressure of, and

10 said location of a touch on said tactile sensor; and

a computer-readable medium for storing said computer codes.

22. The computer program product of claim 21 wherein:

15 said computer-readable medium comprises a floppy disk, a magnetic storage disk or tape, a CD-ROM, or a hard drive.

23. The computer program product of claim 21 wherein:

20 said computer code for defining said input button provides a user to configure said input button as a toggle button, a pressure-sensitive button, a time-sensitive button, a one-dimensional control button, a two-dimensional control button, or a repeat button.

24. A system for controlling devices in an industrial or harsh environment, said system comprising:

25 an operating control panel having a foam tactile sensor, a representation of input buttons on said foam tactile sensor, and electronics, wherein said electronics are capable of measuring a pressure level and a location from a touch on said representation of input buttons on said foam tactile sensor, processing said pressure level and said location, and outputting a signal that causes a function associated with

30 said pressure level and said location; and

an external device coupled to said operating control panel for receiving said signal and performing said function.

25. The system of claim 24, further comprising software for reconfiguring said input buttons on said representation of said operating control panel and loading said reconfigured input buttons and associated functions to said operating control panel, wherein said electronics are capable storing said reconfigured input buttons and associated functions so as to cause said external device coupled to said operating control panel to perform according to the reconfigured input buttons.

26. The system of claim 24, wherein said external device includes a motor controller, a temperature controller, a PLC, a computer, a sensor, a pressurizer, a laser, a furnace, a whirlpool, or a mechanical manipulation device.